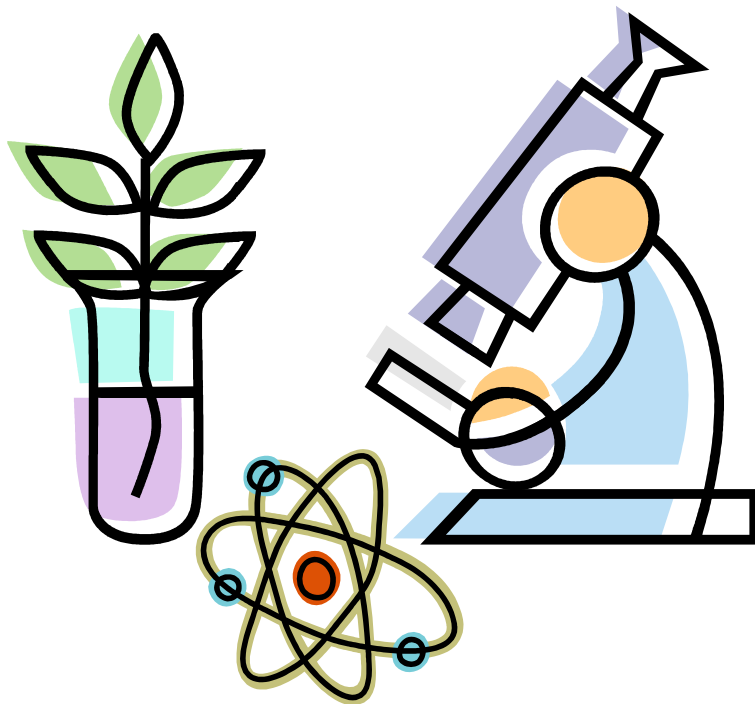


# BCIT 2012/2013 Biotechnology Career Awareness Program



This package contains:

- Program Overview
- Summary of Events
- Criteria
- Workshop Descriptions
- Career options
- Application form

# Program Overview

Welcome to the twelfth year of the Biotechnology Career Awareness Program. The program is directed at Grade 10, 11 and 12 students with an interest in science and is built on a partnership between BCIT, Life Sciences BC, local biotechnology companies and participating school districts.

The program consists of a series of integrated elements (please see Summary of Events):

- A student application and selection process
- Final student selection
- Laboratory workshops at BCIT
- Industry visits

There will be **48** openings for the workshops and industry visits. The program will assign an initial student quota to each district and every effort will be made to accommodate interested students if district quotas are not filled.

Districts will be responsible for student selection ensuring that students meet the selection criteria (please see Selection Criteria and the attached application form). **It is very important that students rank their workshop preferences rather than only indicating their first choice.** If students are only able to make one of the workshops, we will do our best to accommodate them.

The program will provide bus transportation (when applicable) between the laboratory and the industry site. The Biotechnology Career Awareness Program working group endeavors to improve the program each year. We welcome your feedback on any part of the program at any time.

Thank you for helping make the program the success it has become.

The Program Planning Committee

# Getting Started

- ✓ Students meeting the stated selection criteria apply to their teachers using the application form (last two pages of this document).
- ✓ District coordinator, teacher or school representative sends via fax or e-mail application forms (**preferred**) to BCIT Biotechnology department by **OCTOBER 31<sup>ST</sup>, 2012.**

**NOTE TO TEACHERS/FACILITATORS:** Please submit completed forms as soon as they are received to secure seat booking. Applications are accepted from September to October and workshop placements are on a **first-come first-serve** basis. Accepted students will be notified via email by the week of November 5<sup>th</sup>, 2012.

- ✓ **NEW!** In order to confirm seat, each student fee payment **MUST** be received by BCIT **no later than FRIDAY NOVEMBER 16, 2012.** If payment is not received by deadline, seats will be offered to applicants on the waiting list.

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## Summary of Events

<b>October 31<sup>th</sup>, 2012</b>	Deadline for submission of student applications to BCIT.
<b>November 16, 2012</b>	Deadline for cheque payment from students
<b>December 10-14, 2012</b>	BCIT workshop A (includes industry visit)
<b>April 22-26, 2013</b>	BCIT workshop B (includes industry visit)

Send application forms to:

Email:  
[biotech@bcit.ca](mailto:biotech@bcit.ca)

Fax:  
604- 432-1816

**After receiving confirmation of acceptance, send 150\$ cheque to:**

Fran Taylor  
**Revenue Accounting**  
BCIT  
3700 Willingdon Avenue  
Burnaby, BC V5G 3H2

**\*\*Make cheque payable to BCIT BIOTECHNOLOGY. Clearly indicate “Biotechnology Career Awareness Workshop for (name of student)” on the front of cheque**

# Criteria

## Eligible students must:

- Have an expressed interest in science-related curriculum, be enthusiastic about scientific research and lab work, and be interested in learning about careers related to biotechnology
- Be a Grade 10, 11 or 12 students (participants from last year's program will be considered if places are not filled by new applicants)
- Actively participate in the lab-based workshops
- Be able to initiate and maintain conversation with practicing professionals at an industry site concerning occupational information and scientific focus

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# Refund Policy

Refunds for students who cancel their participation in the Program will be reviewed under BCIT's part time studies refund guidelines and ultimately determined by the staff in BCIT's School of Health Sciences. **Please contact Leesa Watt 604-432-8831 or [biotech@bcit.ca](mailto:biotech@bcit.ca) to discuss cancellation and refund process.** The cost for each workshop is \$150.00/student, this includes the materials and transportation to and from for the industry visit, if needed.

# BCIT Workshop Description

Monday Lecture AM	<p>Part 1:</p> <p>What is biotechnology?</p> <ul style="list-style-type: none"> <li>▪ Renaissance or Revolution</li> <li>▪ The component technologies</li> <li>▪ Applications of Biotechnology</li> </ul> <p>Basic Biotechnology Principles</p> <ul style="list-style-type: none"> <li>▪ Cell theory</li> <li>▪ The role of Protein</li> <li>▪ How genes are turned into proteins</li> <li>▪ Extra-chromosomal DNA</li> </ul> <p>Part 2: The Component Technologies</p> <ul style="list-style-type: none"> <li>▪ Selective breeding</li> <li>▪ Selective mutation</li> <li>▪ Recombinant DNA technology</li> </ul>
Lab PM	<p>Lab 1: Use of Micropipettors and Spectrophotometers</p> <p>Lab 2: Preparation of culture</p> <p>Lab 5: The growth of mammalian cells</p>
Tuesday Lecture AM	<p>Cell Culture Theory</p> <ul style="list-style-type: none"> <li>▪ Defining Cell Culture</li> <li>▪ Animal Cell culture</li> <li>▪ Plant Cell culture</li> </ul> <p>Cell Fusion Technology</p> <ul style="list-style-type: none"> <li>▪ What is cell fusion?</li> <li>▪ Gene transfer by cell fusion</li> <li>▪ The monoclonal antibody</li> </ul> <p>Fermentation Technology</p> <ul style="list-style-type: none"> <li>▪ What is an enzyme?</li> <li>▪ Bioreactors</li> </ul> <p>Enzyme Technology</p> <ul style="list-style-type: none"> <li>▪ What is an enzyme</li> <li>▪ Uses of enzymes</li> </ul> <p>Immobilization Technology</p> <ul style="list-style-type: none"> <li>▪ Definition</li> <li>▪ Uses</li> </ul>
Lab PM	<p>Lab 3: Plasmid Preparation</p> <p>Lab 6: Plant and Cell Culture</p>

Wednesday Lecture AM	Part 3 Application of Biotechnology  Applications in Health Care <ul style="list-style-type: none"> <li>▪ Diagnosis of disease</li> <li>▪ Treatment of disease</li> </ul> Applications in Plant agriculture <ul style="list-style-type: none"> <li>▪ Genetic engineering in plants</li> <li>▪ Micropropagation of plants</li> <li>▪ Biological Fertilizers</li> </ul> Applications in Animal Agriculture <ul style="list-style-type: none"> <li>▪ Animal health</li> <li>▪ Reproductive manipulation in animals</li> </ul>
Lab PM	Lab 4: Restriction digests and gel electrophoresis
Thursday Lecture AM	Application of Forestry <ul style="list-style-type: none"> <li>▪ Genetics enhancement of trees</li> <li>▪ Disease control</li> <li>▪ Seedling productions</li> <li>▪ Forest products biotechnology</li> </ul> Food Biotechnology <ul style="list-style-type: none"> <li>▪ Bioprocessing</li> <li>▪ Fermentation</li> <li>▪ Single Cell Protein</li> </ul> Environmental Applications <ul style="list-style-type: none"> <li>▪ Sewage treatment</li> <li>▪ Bioremediation</li> <li>▪ Biological mining</li> </ul> Mining Biotechnology <ul style="list-style-type: none"> <li>▪ Bioprospecting the seas</li> <li>▪ Aquaculture</li> </ul>
Lab PM	Lab 8: ELISA Lab 7: DNA fingerprinting
Friday Lecture AM	Ethics in Biotechnology <ul style="list-style-type: none"> <li>▪ Biomedical ethics</li> <li>▪ Environmental release</li> <li>▪ Food safety and quality</li> <li>▪ Animal well being</li> <li>▪ Social and economic consequences</li> <li>▪ Intellectual property</li> </ul>
PM	Industry Visits

# Workshop Information

## BCIT Workshop

**December 10-14, 2012**

**April 22-26, 2013**

Biotechnology Laboratory  
SW09 208, BCIT Burnaby Campus  
[BCIT Biotechnology map](#)

# Careers in Biotechnology

## In Research & Development

### – Research Scientist

Responsible for initiating, directing and executing all preclinical scientific research and/or development strategies for a company through the research staff or individual studies which are critical.  
Typically requires a PhD in a scientific discipline.

### – Research Associate

Responsible for research and/or development in collaboration with others for projects.  
Typically requires a B.Sc. or a M.Sc. in related field.

### – Laboratory Assistant

Responsible for performing a wide variety of research and/or development laboratory tasks and experiments.  
Requires a high school diploma or some laboratory experience.

### – Quality Control Analyst

Responsible for conducting routine and non-routine analysis of raw materials, in process, and finished formulations according to standard operating procedures.  
Typically requires a B.Sc.

### – Quality Assurance Associate

Responsible for performing a wide variety of activities pertaining to assuring compliance with applicable regulatory requirements by conducting audits, training programs, data and documentation reviews and analysis.  
Typically requires a B.Sc.

## **In Regulatory Affairs**

### **– Regulatory Affairs Associate**

Responsible for the coordination and preparation of document packages for regulatory submissions to regulatory bodies, such as the Food and Drug Administration (FDA) in the US and the Therapeutic Drug Program in Canada, from all areas of the company, internal audits and inspections. Typically requires a B.Sc.

### **– Manufacturing Associate**

Responsible for the implementation of production and large scale manufacturing procedures to optimize processes and regulatory requirements. Typically requires a B.Sc.

### **– Process Development Scientist**

Responsible for the development of methods for the production, purification, fermentation and testing of new process formulas, technologies and products. Typically requires a PhD in a scientific discipline.

## **In Clinical Research**

### **– Medical Director**

Responsible for managing the direction, planning, execution, and interpretation of clinical trials (clinical trials are research involving humans) and the data collection activities. Typically requires a MD or PhD.

### **– Medical Writer**

Responsible for researching, writing, and editing clinical reports, summarizing data from clinical studies for submissions to the FDA and for publication and/or presentation. Typically requires a B.Sc. or M.Sc.

### **– Clinical Research Associate**

Responsible for the design, planning, implementation and overall direction of clinical research projects. Typically requires a B.Sc., RN or BSN degree.

### **– Biostatistician**

Responsible for the design, development, modification and evaluation of a technical infrastructure to expedite conducting and evaluation of clinical trials. Typically requires a M.Sc. or PhD.



## **In Corporate Affairs and Administration**

### **– Business Development Manager**

Responsible for managing the research and analysis of business opportunities and assessing potential markets to make recommendations for new projects to be used for strategic marketing decisions.

Typically requires a B.Sc. and a MBA.

### **– Market Research Analyst**

Responsible for researching and analyzing the company's markets, competition and product mix.

Typically requires a Bachelors degree.

### **– Patent Agent**

Works with scientific staff to prepare for filing and processing of patent applications for the company.

Typically requires a Bachelors degree.

### **– Librarian**

Responsible for efficient management of in-house library.

Typically requires a MLS.

### **– Corporate Communication / Investor Relations**

Responsible for planning, preparing and disseminating information concerning the company to the internal and external investment community.

Typically requires a Bachelors degree and a MBA.

### **– Controller**

Responsible for coordinating, administering and controlling the financial operations of the organization.

Typically requires a B. Commerce and an accounting designation such as CGA or CA.

### **– Facilities Management**

Responsible for managing the design, planning, construction and maintenance of equipment, machinery, buildings and other facilities.

Typically requires a Bachelors degree.

### **– Technical Services Associate**

Responsible for providing technical direction and support to customers on operation and maintenance of company products.

Typically requires a Bachelors degree.

### **– Health & Safety Specialist**

Responsible for developing, implementing and monitoring industrial health and safety programs within the company.

Typically requires a Bachelors degree.

– **Purchasing Specialist**

Responsible for obtaining materials, scientific equipment and services and office/business supplies.

Typically requires a Bachelors degree and PMAC designation.

– **Human Resources Associate**

Responsible for one or more of the following activities in human resources administration including employment, compensation, benefits, employee relations, equal employment opportunity or training programs.

Typically requires a Bachelors degree.

## Program Contact

If you have any questions regarding this information or the program please contact:

Leesa Watt 604-432-8831 or  
Carol Fong 604-453-4074

Or e-mail

[biotech@bcit.ca](mailto:biotech@bcit.ca)

## Planning Committee Members

**Post Secondary:**

Dr. Lesley Esford – NRC-IRAP

Dr. Paul Barran –NRC-IRAP

Dr. David Ng – UBC

**Industry Representative:**

TBA

**Program Manager:**

Leesa Watt BCIT Biotechnology Program

# BCIT 2012/2013 CAREER AWARENESS APPLICATION FORM

**PLEASE COMPLETE THIS FORM AND RETURN IT TO YOUR TEACHER**

Applicants Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Personal Education Number: \_\_\_\_\_

Gender: \_\_\_\_\_

Grade: \_\_\_\_\_ School: \_\_\_\_\_ District #: \_\_\_\_\_

Teacher's Name: \_\_\_\_\_ Average Grade (letter): \_\_\_\_\_

Did you apply to this program in 2011/12? ☐ Yes ☐ No

**BCIT will possibly be using photographs of participating students for promotional material for this program. Parental permission is needed.**

*My personal information (photographic/video image only) may be collected under the Authority of the Institute Act (RSBC 1996, Ch.225) for the purposes of instruction or promotion. I hereby authorize BCIT exclusive permission to use this information for purposes of promotion of BCIT programs and graduates and marketing in any published or displayed media format for no charge.*

Participant Name: \_\_\_\_\_

Parent Name: \_\_\_\_\_

Parent Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**The Biotechnology Career Awareness Program includes the following activities. Please indicate whether you can attend one or both of these activities:**

**1. Please rank your choice (1 being most preferred) of the following workshops:**

☐ Workshop A (**December 10-14, 2012**)

☐ Workshop B (**April 22-26, 2013**)

**Please answer the following questions:**

1. What are your long-range career goals?

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2. On a Scale from 1 to 10 (10 being very comfortable), how comfortable are you asking questions to professionals and post-secondary instructors? \_\_\_\_\_

3. What courses have you taken in secondary school that would relate to this career field?

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4. What have you done to prepare yourself to study and work in this area (volunteer experience, related jobs, extra curricular activities, etc.)?

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